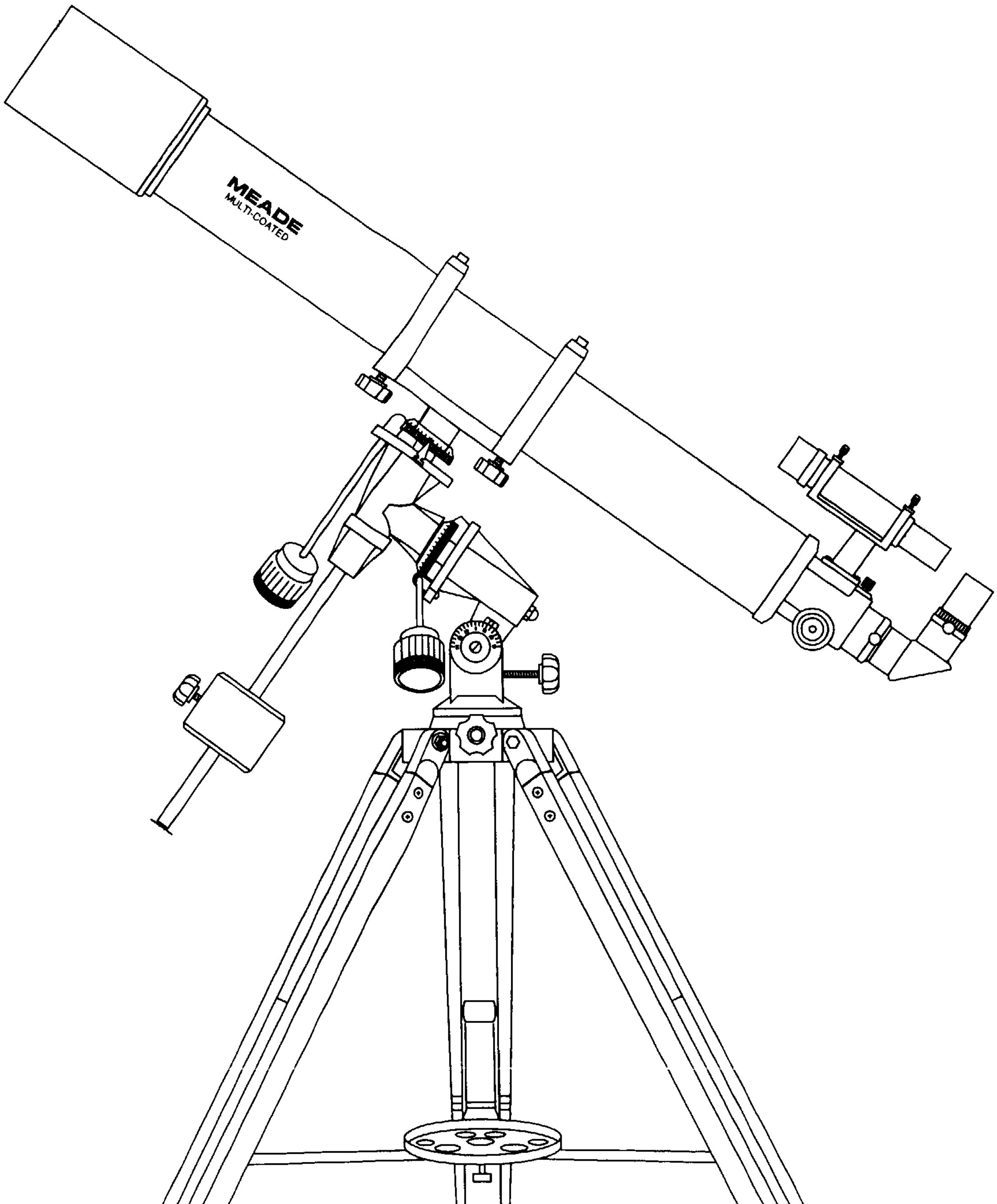
Instruction Manual

Model 395: 90mm Equatorial Refracting Telescope



Meade Instruments Corporation

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WARNING

NEVER ATTEMPT TO OBSERVE THE SUN THROUGH YOUR MEADE TELESCOPE! OBSERVING THE SUN, EVEN FOR THE SHORTEST FRACTION OF A SECOND, WILL CAUSE INSTANT AND IRREVERSIBLE EYE DAMAGE. WHEN OBSERVING DURING THE DAYTIME, DO NOT POINT THE TELESCOPE EVEN CLOSE TO THE SUN.

Meade Limited Warranty

Every Meade telescope, spotting scope, and binocular is warranted by Meade Instruments Corp. (MIC) to be free of defects in materials and workmanship for a period of **ONE YEAR** from date of original retail purchase in the U.S.A. MIC will repair or replace the product, or part thereof, found upon inspection by MIC to be defective, provided the defective part or product is returned to MIC, freight prepaid, with proof of purchase. This warranty applies to the original purchaser only and is non-transferable. Meade products purchased outside North America are not included in this warranty, but are covered under separate warranties issued by Meade International Distributors.

RGA Number Required: Prior to the return of any product or part, a Return Goods Authorization (RGA) number **must** be obtained by writing to MIC or calling 714-756-2291. Each returned part or product must include a written statement detailing the nature of the claimed defect, as well as the owner's name, address, phone number, and a copy of the original sales invoice.

This warranty is not valid in cases where the product has been abused or mishandled, where unauthorized repairs have been attempted or performed, or where depreciation of the product is due to normal wear-and-tear. MIC specifically disclaims special, indirect, or consequential damages or lost profit, which may result from a breach of this warranty. Any implied warranties which can not be disclaimed are hereby limited to a term of one year from the date of purchase by the original retail purchaser.

This warranty gives you specific rights. You may have other rights which vary from state to state.

MIC reserves the right to change product specifications or to discontinue products without prior notice.

This warranty supersedes all previous Meade product warranties.

Key to Fig. 1

1. Tripod legs
2. Equatorial mount
3. R.A. flexible cable control
4. Dec. flexible cable control
5. Counterweight
6. Counterweight shaft
7. Counterweight lock
8. Safety washer/knob
9. Latitude lock
10. Polar axis
11. Latitude adjustment knob
12. Optical tube assembly
13. Optical tube saddle plate
14. Cradle rings
15. Cradle ring lock knobs
16. Diagonal mirror
17. Focuser
18. Focuser thumbscrew
19. Eyepiece
20. Diagonal thumbscrew
21. Declination axis
22. R.A. lock
23. Dec. lock
24. 6 x 30 viewfinder
25. Telescope front dust cover
26. Viewfinder bracket thumbscrews
27. R.A. setting circle
28. Dec. setting circle
29. Latitude scale
30. Azimuth lock
31. Focus knobs
32. Polar shaft acorn cap nut
33. Azimuth base
34. Azimuth shaft bolt
35. R.A. worm block assembly
36. Dec. worm block assembly
37. Dew shield
38. Viewfinder bracket
39. Objective lens cell
40. Leg brace supports
41. Tripod leg lock knobs
42. Accessory shelf central mounting knob
43. Tripod leg Phillips-head fastener screws
44. Tripod leg bolt 1/2" nuts
45. Accessory shelf

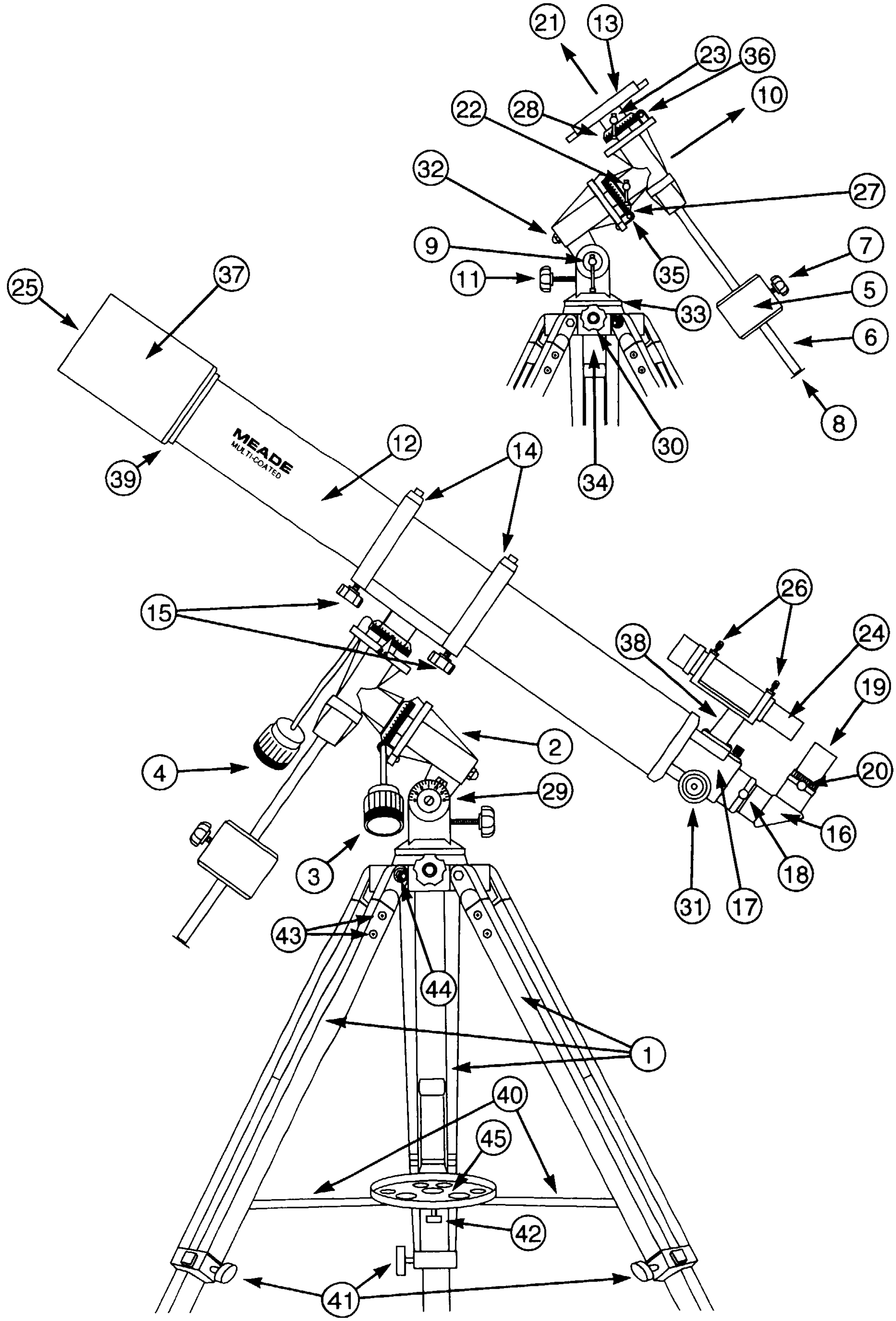


Fig. 1: Meade Model 395: 90mm Equatorial Refracting Telescope

A. Introducing the Meade Model 395

The Model 395 is an easy-to-operate, high performance 90mm refracting telescope, intended for astronomical and terrestrial (land) observing. Equipped with a deluxe equatorial mount, and aluminum tripod, the telescope's motion is continuously adjustable for tracking celestial or land objects. Your telescope comes to you ready for adventure; it will be your companion in a universe of planets, breathtaking landscapes, galaxies, and stars.

1. This Manual

These instructions detail the set-up, operation, specifications, and optional accessories of your Meade Model 395. In order that you may achieve maximum enjoyment of the instrument, we urge that you take a few minutes to read all of this manual before making first observations through the telescope. As you read this manual, the technical terms associated with telescopes will be made clear.

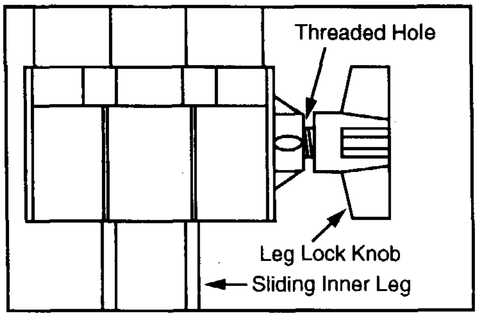
2. Standard Equipment

- Complete optical tube assembly with multi-coated 90mm diameter objective lens, dew shield, cradle rings, viewfinder bracket, and 1.25" rack and pinion focuser. Lens focal length = 1000mm; f/11.
- Equatorial mount with pre-attached heavy duty, continuously adjustable, aluminum tripod and leg braces.
- Accessories: MA25mm (40x) eyepiece (1.25" O.D.)
  Diagonal mirror (1.25" O.D.)
  Counterweight with counterweight shaft
  Flexible cable controls for both telescope axes
  Accessory shelf with mounting knob
  6 x 30 viewfinder

B. Unpacking and Assembly (Numbers in brackets refer to Fig. 1, above)

Your Meade Model 395 comes to you packaged almost entirely pre-assembled. You will find upon opening the giftbox that there are two compartments within that contain the optical tube assembly and the tripod with equatorial mount. The accessories described above will be located within compartments custom-cut into the styrofoam block inserts. (References herein–*e.g.* (6)–are to Fig.1 unless otherwise specified.)

- Remove and identify the telescope's Standard Equipment listed in Section A.2., above.
- The three tripod lock knobs (41) have been removed from the bottom section of each tripod leg to insure safe arrival of the tripod assembly. To install, thread in each tripod lock knob into the threaded hole located at the right side of each of the three gray colored castings (see illustration below) at the bottom of each tripod leg. Tighten the tripod lock knob only to a "firm feel" to avoid damage to the tripod caused by overtightening.



- Spread the tripod legs (1) to full extension so that the leg braces (40) are taut (should one of the tripod leg braces slip out of the center triangle fastener, merely reposition the brace and slide it back into position). Adjust the tripod with the attached equatorial mount (2) to the desired height by loosening the tripod lock knobs and extend the sliding inner section of each tripod leg; then tighten each knob.
- Remove the mounting knob (42) from the round accessory shelf. Place the accessory shelf on top of the center triangle leg brace fastener of the tripod so that the threaded stud protruding from the bottom of the accessory shelf (45) passes through the hole in the center. Then replace and tighten the accessory shelf mounting knob (42).
- Attach the flexible cable controls (3) and (4). These cable controls are secured in place with a firm tightening of the thumbscrew located at the end of each cable.
- The viewfinder bracket (38) comes pre-attached to the optical tube, but the viewfinder (24) is shipped separately. Place the viewfinder into the viewfinder bracket rings by backing off the thumbscrews. Then center the viewfinder in both bracket rings by backing off the three thumbscrews (26) on each bracket ring. Orient the viewfinder so its front objective lens is pointing in the same direction as the main

telescope's objective lens (39).

- Holding the counterweight (5) firmly in one hand, slip the counterweight onto the counterweight shaft (6). Attach the counterweight (5) and counterweight shaft (6), by supporting the unlocked (7) counterweight firmly in one hand, while threading the counterweight shaft into the base of the Declination axis of the telescope's equatorial mount with the other (see Fig. 1). Once firmly attached, slide the counterweight to the midpoint on the counterweight shaft and secure it in place with the lock knob (7) of the counterweight. Note: If the counterweight ever slips, the secured threaded safety washer/knob (8) will not let the weight slide entirely off the counterweight shaft. **Be certain that this safety washer/knob is always in place.**
- Release the latitude lock (9) of the equatorial mount, and tilt the polar axis (10) of the telescope to roughly a 45° angle by turning the latitude adjustment knob (11). With the polar axis thus tilted, firmly retighten the latitude lock.
- While firmly holding the optical tube (12) position it onto the optical tube saddle plate (13), with the midpoint of the optical tube's length lying roughly in the center of the saddle plate. Then slide the cradle rings (14) over the saddle plate of the mount. Tighten the cradle lock knobs (15) to a firm feel. Do not overtighten these knobs. Make sure the focuser mechanism is on the same side of the saddle plate as the Declination slow-motion control (4).
- Insert the diagonal mirror (16) into the focuser (17), and tighten the focuser thumbscrew (18), to secure the diagonal mirror.
- Insert the MA25mm eyepiece (19) into the diagonal mirror, and tighten the diagonal thumbscrew (20) to secure the eyepiece.

The telescope is now fully assembled. Before it can be properly used, however, the telescope must be balanced and the viewfinder aligned.

1. Balancing the Telescope

In order for the telescope to move smoothly on its mechanical axes, it must first be balanced about the 2 telescope axes: the polar axis (10) and the Declination axis (21). All motions of the polar aligned telescope (more on this later) take place by moving about these two axes, separately or simultaneously. To obtain a fine balance of the telescope, follow the method below:

- Loosen the R.A. lock (22) and rotate the telescope so that the counterweight shaft (6) is parallel to the ground (horizontal).
- Slide the counterweight (5) along the counterweight shaft (6) until the telescope remains in one position without tending to drift in either direction. Then tighten the counterweight lock knob (7), locking the counterweight in position.
- Lock the R.A. lock (22), and unlock the Declination lock (23), but keep the counterweight shaft in its horizontal position. The telescope will now turn freely about the Declination axis. Loosen the cradle ring lock knobs (15) so that the main tube in the cradle rings slides easily up-or-down in the cradle rings. Move the main tube in the cradle rings until it is balanced rotationally about the Declination axis. Relock the knobs (15).

The telescope is now properly balanced on both axes.

2. Alignment of the Viewfinder

The wide field of view provided by the 6 x 30mm viewfinder permits easy object sighting prior to observation in the higher-power main telescope. The 6 x 30 Viewfinder (24) must be attached to the viewfinder bracket (38) as seen in Fig. 1. In order for the viewfinder to be functional, however, it must be aligned to the main telescope, so that both the viewfinder and main telescope point at the same position in the sky. With this simple alignment performed, finding objects is greatly facilitated, since you will first locate an object in the wide-field viewfinder, then you will look in the eyepiece of the main telescope for a detailed view. To align the viewfinder follow these steps:

- Remove the telescope front dust cover (25), and the dust covers of the viewfinder.
- Place the low- power (MA25mm) eyepiece into the focuser of the main telescope.
- Unlock the R.A. lock (22) and the Dec. lock (23) so that the telescope turns freely on both axes. Then point the main telescope at some well-defined land object (*e.g.* the top of a telephone pole) at least 200 yards distant, and re-lock the R.A and Dec. axes. Turn the flexible cable controls, (3) and (4), to center the object in the telescopic field.

- With the front of the viewfinder already centered in the front bracket ring, look through the viewfinder and loosen or tighten, as appropriate, one or more of the rear viewfinder bracket ring thumbscrews (26) until the viewfinder's crosshairs are likewise centered on the object previously centered in the main telescope.
- Check this alignment on a celestial object, such as a bright star or the Moon, and make any refinements necessary, using the method outlined above. With this alignment performed, objects first located in the wide-field of the viewfinder will also be centered in the main telescope's field of view. (Note: The viewfinder presents an image which is upside-down; this orientation is customary in astronomical viewfinders.)

C. Understanding Celestial Movements and Coordinates

Understanding where to locate celestial objects, and how those objects move across the sky is fundamental to enjoying the hobby of astronomy. Most amateur astronomers adopt the simple practice of "star-hopping" to locate celestial objects by using star charts or astronomical software which identify bright stars and star patterns (constellations) that serve as "road maps" and "landmarks" in the sky. These visual reference points guide amateur astronomers in their search for astronomical objects. And, while star-hopping is the preferred technique, a discussion of using setting circles for locating objects is desirable since your telescope is provided with this feature. However, be advised, compared to star-hopping, object location by use of setting circles requires a greater investment in time and patience to achieve a more precise alignment of the telescope's polar axis to the celestial pole. For this reason, in part, star-hopping is popular because it is the faster, easier way to become initiated in the hobby.

Understanding how astronomical objects move: Due to the Earth's rotation, celestial bodies appear to move from East to West in a curved path through the skies. The path they follow is known as their line of Right Ascension (R.A.). The angle of this path they follow is known as their line of Declination (Dec.). Right Ascension and Declination is analogous to the Earth-based coordinate system of latitude and longitude.

Understanding celestial coordinates: Celestial objects are mapped according to the R.A. and Dec. coordinate system on the "celestial sphere," the imaginary sphere on which all stars appear to be placed. The Poles of the celestial coordinate system are defined as those 2 points where the Earth's rotational axis, if extended to Infinity, North and South, intersect the celestial sphere. Thus, the North Celestial Pole is that point in the sky where an extension of the Earth's axis through the North Pole intersects the celestial sphere. In fact, this point in the sky is located near the North Star, or Polaris.

On the surface of the Earth, "lines of longitude" are drawn between the North and South Poles. Similarly, "lines of latitude" are drawn in an East-West direction, parallel to the Earth's equator. The celestial equator is simply a projection of the Earth's equator onto the celestial sphere. Just as on the surface of the Earth, imaginary lines have been drawn on the celestial sphere to form a coordinate grid. Celestial object positions on the Earth's surface are specified by their latitude and longitude.

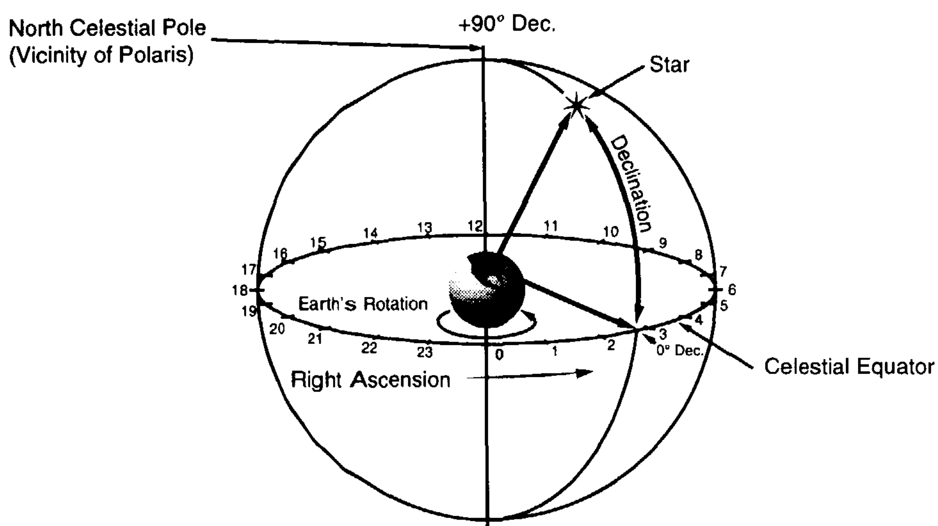


Fig. 2: Celestial Sphere

The celestial equivalent to Earth latitude is called "Declination," or simply "Dec," and is measured in degrees, minutes or seconds north ("+") or south ("-") of the celestial equator. Thus any point on the celestial equator (which passes, for example, through the constellations Orion, Virgo and Aquarius) is specified as having 0°0'0" Declination. The Declination of the star Polaris, located very near the North Celestial Pole, is +89.2°.

The celestial equivalent to Earth longitude is called "Right Ascension," or "R.A." and is measured in hours, minutes and seconds from an arbitrarily defined "zero" line of R.A. passing through the constellation Pegasus. Right Ascension coordinates range from 0hr0min0sec up to (but not including) 24hr0min0sec. Thus there are 24 primary lines of R.A., located at 15 degree intervals along the celestial equator. Objects located further and further east of the prime (0h0m0s) Right Ascension grid line carry increasing R.A. coordinates.

With all celestial objects therefore capable of being specified in position by their celestial coordinates of Right Ascension and Declination, the task of finding objects (in particular, faint objects) in the telescope can be simplified. The setting circles, R.A. (27) and Dec. (28) of the Model 395 telescope may be dialed, in effect, to read the object's coordinates, positioning the object in the vicinity of the telescope's telescopic field of view. However, these setting circles may be used to advantage only if the telescope is first properly aligned with the North Celestial Pole.

D. Lining Up with the Celestial Pole

Objects in the sky appear to revolve around the celestial pole. (Actually, celestial objects are essentially "fixed," and their apparent motion is caused by the Earth's axial rotation). During any 24 hour period, stars make one complete revolution about the pole, making concentric circles with the pole at the center. By lining up the telescope's polar axis with the North Celestial Pole (or for observers located in Earth's Southern Hemisphere with the South Celestial Pole), astronomical objects may be followed, or tracked, simply by moving the telescope about one axis, the polar axis.

If the telescope is reasonably well aligned with the pole, therefore, very little use of the telescope's Declination flexible cable control is necessary — virtually all of the required telescope tracking will be in Right Ascension. (If the telescope were perfectly aligned with the pole, no Declination tracking of stellar objects would be required). For the purposes of casual visual telescopic observations, lining up the telescope's polar axis to within a degree or two of the pole is more than sufficient: with this level of pointing accuracy, the telescope can track accurately by slowly turning the telescope's R.A. flexible cable control and keep objects in the telescopic field of view for perhaps 20 to 30 minutes.

To line up the Model 395 with the pole, follow this procedure:

1) Release the Azimuth lock (30) of the Azimuth base (33), so that the entire telescope-with-mounting may be rotated in a horizontal direction. *Rotate the telescope until the polar axis (10) points due North.* Use a compass or locate Polaris, the North Star (see Fig. 3), as an accurate reference for due North.
2) Level the mount, if necessary, by adjusting the heights of the three tripod legs.
3) Determine the latitude of your observing location by checking a road map or atlas. Release the latitude lock (9) and turn the latitude adjustment knob (11) to tilt the telescope mount so that the pointer indicates the correct latitude of your viewing location on the latitude dial (29). Re-tighten the latitude lock (9).

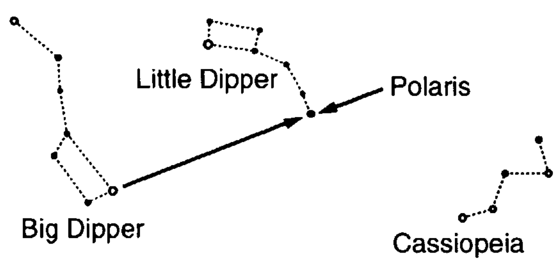


Fig. 3: Finding Polaris

4) If steps (1) - (3) above were performed with reasonable accuracy, your telescope is now sufficiently well-aligned to the North Celestial Pole for visual observations.

Once the mount has been polar-aligned as described above, the latitude angle need not be adjusted again, unless you move to a different geographical location (*i.e.* a different latitude). The only polar alignment procedure that need be done each time you use the telescope is to point the polar axis due North, as described in step (1) above.

E. Using the Telescope

With the telescope assembled, balanced and polar aligned as described above, you are ready to begin observations. Decide on an easy-to-find object such as the Moon, if it is visible, or a bright star to become accustomed to the functions and operations of the telescope. For the best results during observations, follow the suggestions below:

- To center an object in the main telescope, loosen the telescope's R.A. lock (22) and Dec. lock (23). The telescope can now turn freely on its axes. Use the aligned viewfinder to first sight-in on the object you wish to observe; with the object centered on the viewfinder's crosshairs, re-tighten the R.A. and Dec. locks.
- If you have purchased an assortment of eyepieces (see Section G on Calculating Power and Section J on Optional Accessories for higher and lower powers with the telescope), always start an observation with a low power eyepiece (*e.g.* MA25mm eyepiece); get the object well-centered in the field of view and sharply focused. Then try the next step up in magnification. If the image starts to become fuzzy as you work into higher magnifications, then back down to a lower power; the atmospheric steadiness is not sufficient to support high powers at the time you are observing. Keep in mind that a bright, clearly resolved but smaller image will show far more detail than a dimmer, poorly resolved larger image. The MA25mm eyepiece included with the Model 395 presents a wide field of view, ideal for general astronomical observing of star fields, clusters of stars, nebulae, and galaxies; it is also probably the best eyepiece to use in the initial finding and centering of any object.
- Once centered, the object can be focused by turning one of the knobs of the focusing mechanism (31). You will notice that the astronomical object in the field of view will begin to slowly move across the eyepiece field. This motion is caused by the rotation of the Earth on its axis, as described in Section C, although the planets and stars, are, for practical purposes, fixed in their positions in the sky. The platform on which the telescope is sitting (the Earth) rotates once every 24 hours under these objects. **To keep astronomical objects centered in the field of the polar aligned telescope, simply turn the R.A. flexible cable control (3).** These objects will appear to move through the field more rapidly at higher powers. Note that the Declination flexible cable control is used only for centering purposes, and not for tracking.
- Avoid touching the eyepiece while observing through the telescope. Vibrations resulting from such contact will cause the image to move. Likewise, avoid observing sites where ground-based vibrations may resonate the tripod. Viewing from the upper floors of a building may also introduce image movement.
- You should allow a few minutes to allow your eyes to become "dark adapted" before attempting any serious astronomical observations. Use a red filtered flashlight to protect your night vision when reading star maps or inspecting the components of the telescope.
- Avoid setting up the telescope inside a room and observing through an open window (or worse yet, a closed window). Images viewed in such a manner may appear blurred or distorted due to temperature differences between inside and outside air. Also, it is a good idea to allow your telescope a chance to reach the ambient (surrounding) outside temperature before starting an observing session.

We repeat the warning stated at the outset of this manual: **Never point the telescope directly at or near the Sun at any time! Observing the Sun, even for the smallest fraction of a second, will result in instant and irreversible eye damage, as well as physical damage to the telescope itself.**

- Avoid viewing objects low on the horizon–objects will appear better resolved with far greater contrast when viewed higher in the sky. Also, if images appear to "shimmer" in the eyepiece–reduce power until the image steadies. This condition is caused by air turbulence in the upper atmosphere.

The Meade Model 395 may be used for a lifetime of rewarding terrestrial and astronomical observing, but basic to your enjoyment of the telescope is a good understanding of the instrument. Read the above instructions carefully until you understand all of the telescope's parts and functions. One or two observing sessions will serve to clarify these points forever in your mind.

The number of fascinating objects visible through your Meade refractor is limited only by your own motivation. Astronomical software, such as Meade's *AstroSearch*, or a good star atlas, such as the "Meade

Star Charts" (see Optional Accessories, page 11) will assist you in locating many interesting celestial objects. These objects include:

- Cloud belts across the surface of the planet Jupiter.
- The 4 major satellites of Jupiter, visible in rotation about the planet, with the satellite positions changing each night.
- Saturn and its famous ring system, as well as several satellites of Saturn, much fainter than the major satellites of Jupiter.
- The Moon: A veritable treasury of craters, mountain ranges and fault lines. The best contrast for viewing the Moon is during its crescent phase. The contrast during the full Moon phase is low due to the angle of illumination.
- Deep-Space: Nebulae, galaxies, multiple star systems, star clusters–hundreds of such objects are visible through the Model 395.
- Terrestrial objects: Your Meade Model 395 may be used for high-resolution land viewing. In this case note that the diagonal mirror results in an image which is reversed left-for-right, but which is correctly oriented up and down. For a fully-corrected image, the Meade #928 45° Erect-Image Roof Prism is required. Terrestrial observations should almost always be made using a low-power eyepiece (50x or less), for bright sharp images. Beyond the 50x limit images may appear very poor due to the fact that the images are being viewed through the thickest and most turbulent part of the atmosphere, unlike astronomical observations made by pointing the telescope up and through a thinner atmosphere.

F. Using Setting Circles

Setting circles of the polar aligned equatorial mount can facilitate the location of faint celestial objects not easily found by direct visual observation. To use the setting circles, follow this procedure:

- Use a star chart or star atlas, and look up the celestial coordinates, Right Ascension and Declination (R.A. and Dec.), of an easy-to-find bright star that is within the general vicinity of the faint object you wish to locate.
- Center the determined bright star in the telescope's field of view.
- Manually turn the R.A. setting circle (27) to read the R.A. of the object now in the telescope's eyepiece.
- The setting circles are now calibrated (the Dec. setting circle (28) is factory calibrated). To locate a nearby faint object using the setting circles determine the faint object's celestial coordinates from a star chart, and move the telescope in R.A. and Declination until the setting circles read the R.A. and Dec. of the object you are attempting to locate. If the above procedure has been carefully performed, the faint object will now be in the field of a low power eyepiece.
- The R.A. Setting Circle must be manually re-calibrated on the current Right Ascension of a star every time the telescope is set up, and reset to the centered object's R.A. coordinate before moving to a new R.A. coordinate setting. The R.A. Setting Circle has two sets of numbers, the inner set is for Southern hemisphere use while the outer set of numbers (the set closest to the R.A. gear), is for use by observers located North of the Earth's equator (*e.g.* in North America).

G. Calculating Power

The power, or magnification of the telescope depends on two optical characteristics: the focal length of the main telescope and the focal length of the eyepiece used during a particular observation. For example, the focal length of the Model 395 telescope is fixed at 1000mm. To calculate the power in use with a particular eyepiece, divide the focal length of the eyepiece into the focal length of the main telescope. For example, using the MA25mm eyepiece supplied with the Model 395, the power is calculated as follows:

$$\text{Power} = \frac{1000\text{mm}}{25\text{mm}} = 40\text{x}$$

Meade Instruments manufactures several types of eyepiece designs that are available for your telescope. The <u>type</u> of eyepiece (whether "MA" Modified Achromatic, "SP" Super Plössl, etc.) has no bearing on magnifying power but does affect such optical characteristics as field of view, flatness of field, eye-relief, and

color correction.

The maximum practical magnification is determined by the nature of the object being observed and, most importantly, by the prevailing atmospheric conditions. Under very steady atmospheric "seeing," the Model 395 may be used at powers up to about 250x on astronomical objects. Generally, however, lower powers of perhaps 75x to 175x will be the maximum permissible, consistent with high image resolution. When unsteady air conditions prevail (as witnessed by rapid "twinkling" of the stars), extremely high-power eyepieces result in "empty magnification," where the object detail observed is actually diminished by the excessive power. Under such conditions a planet may appear as a featureless fuzzy orb of bright light.

Assorted eyepieces are available both to increase and decrease the operating eyepiece power of the telescope. If the Model 395 is used on a regular basis, a selection of four to five eyepieces is recommended. For example, an eyepiece assortment of focal lengths 32mm or 40mm, 25mm, 12.5mm, 9mm, and 6mm yields a magnifying range of 31x or 25x, 40x, 80x, 111x, and 167x respectively. A high quality Barlow Lens, such as the Meade Barlow Lens #126, serves to double the power of each of these eyepieces. To use the Barlow Lens, insert the #126 unit into the telescope's focuser first, then insert the diagonal mirror, followed by an eyepiece; the power thus obtained is then double the power obtained when the eyepiece is used alone. For example, the MA25mm eyepiece, when used in conjunction with the #126 2x Telenegative Barlow lens yields 80x.

H. Maintenance

1. Cleaning

As with any quality instrument, lens or mirror surfaces should be cleaned as infrequently as possible. Multi-coated lens surfaces, in particular, should be cleaned only when absolutely necessary. In all cases avoid touching any lens surface. A little dust on the surface of a lens or mirror causes negligible loss of performance and should not be considered reason to clean the surface. When lens cleaning does become necessary, use a camel's hair brush or compressed air gently to remove dust. If the telescope's dust cover is replaced after each observing session, cleaning of the optics will rarely be required. Note: remove the dew shield (37) to access the objective lens (39) for cleaning.

2. Mount and Tripod Adjustments

Every Meade Model 395 equatorial mount and tripod is factory inspected for proper fit and function prior to shipment. It is unlikely that you will need to adjust, or tighten these parts after receipt of the telescope. However, if the instrument received unusually rough handling in shipment, it is possible that some of these assemblies can be loose. To make adjustments you will need a 1/2" or 11/16" socket or adjustable end wrench, a 5/64" hex wrench, and a Phillips-head screwdriver.

The equatorial mount has four main areas that can be adjusted: A loose polar shaft can be tightened by releasing a 5/64" hex set-screw that is on the side of the 11/16" polar shaft acorn cap nut (32), and then turning the 11/16" acorn cap nut clockwise to a firm feel, and then tightening the 5/64" hex set-screw. A loose Azimuth base (33), can be tightened by turning the 11/16" Azimuth shaft bolt (34), located underneath the mount and in between the three tripod legs, clockwise to a firm feel. The R.A. (35), and Dec. (36) worm block assemblies can have backlash removed by releasing the 2 Phillips-head screws on each assembly, applying pressure to the worm block against the worm gear, and then tightening the Phillips-head screws. Note that overtightening of any of the nuts, bolts, or screws can inhibit the smooth rotating action of the axes and gears, and may result in stripping the threads.

The tripod legs have 1/2" nuts (44), and Phillips-head screws (43) that may have backed off, these may also be tightened to a firm feel for the most sturdy performance of the telescope.

I. Specifications: Model 395

Objective (main) lens focal length: 1000mm
Objective lens diameter: . . . . .90mm (3.54")
Focal ratio: f/11
Mounting : . . . . .German equatorial

J. Optional Accessories

Refer to the latest Meade General Catalog.

American-Size Eyepieces (1.25" O.D.): Meade Instruments offers several types of high-performance, American-sized eyepiece to fit every observing requirement and budget. See the Meade General Catalog, Meade advertising in *Sky & Telescope* and *Astronomy* magazines, or contact your full-service Meade dealer for details and suggestions on purchasing optional Meade accessory eyepieces.

#928 Erect-Image Roof Prism 45° (1.25"): This prism produces a fully corrected image in a convenient 45° observing angle for terrestrial observations that are correctly oriented left-for-right, in addition to correctly oriented up-and-down as currently provided by standard Diagonal Mirror (1.25").

#126 2x Barlow Lens (1.25" O.D.): The high-quality #126 Barlow Lens serves to double the power of any American-size (1.25") eyepiece used.

Basic Camera Adapter (1.25" O.D.): Used with or without an eyepiece, the Basic Camera Adapter (1.25") permits direct attachment of 35mm SLR cameras to the Model 395's focuser for short exposure astrophotography of the Moon or for close-up terrestrial photography of distant objects. (Requires T-Mount for your specific brand of 35mm camera.)

Variable Projection Camera Adapter (1.25" O.D.): The Variable Projection Camera Adapter features a machined sliding mechanism, permitting variable projection distances during eyepiece-projection photography. The Variable Projection Camera Adapter (1.25") permits direct attachment of 35mm SLR cameras to the Model 395's focuser. (Requires T-Mount for your specific brand of 35mm camera and an appropriate focal length eyepiece.)

#531 Electric Motor Drive: With the #531 Motor Drive attached, the telescope automatically tracks astronomical objects in their paths across the sky. Three AA size (user-supplied) batteries power the DC servo motor to rotate the Right Ascension control shaft of the telescope at a constant rate that results in one revolution of the telescope in RA every 24 hours, fully compensating for the effects of the Earth's rotation. The #531 Motor Drive easily attaches in minutes to the telescope. A North-South switch permits operation in either of the Earth's Northern or Southern hemispheres.

AstroSearch Sky Software: 3.5" disks for Windows 3.1 or higher. Explore the heavens with AstroSearch and your personal computer—visually displays the night sky and allows the printing of detailed star charts. Provides locations of planets, galaxies, star clusters, nebulae—over 45,000 objects as well as a lunar calendar.

Meade Star Charts: Bound 12" x 14" charts with a large easy-to-read planisphere on the front cover, printed on heavy, coated paper, suitable for field use. Includes listings and mapped locations of hundreds of interesting celestial bodies for observation through the telescope. **Highly recommended!**

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